

# Quality Circle and Productivity; in Kerala Polymer Industry Aspects

Athira V

Student - M.Com, CIMA Calicut University Campus

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**ABSTRACT:** Quality circle is a voluntary group of persons, for better understanding, corporation and inside problem solving of employees. This study covers the area of QC structure, process, productivity and the effect of QC in productivity.

**KEY WORDS:** Quality Circle, Productivity, Polymer Industry.

## I INTRODUCTION

The success of every business depends up on adapting itself to the environment within which it functions. Existing business environment is considered while determining the policy of the business. The environment imposes several constraints on the enterprise. At the same time it has a tremendous impact and influence on business organization. In small business, it is important that to have good co-operative labour-management relations, as well as the support of middle managers for the quality circle program. According to a quality circle is a voluntary group of people, who meet together on a regular basis identify, analyze and solve quality, productivity, cost reduction, safety and other problems in the work area, leading to improvement in their performance and enrichment of their work life Quality circle was originally associated with Japanese management and manufacturing techniques. The introduction of quality circle in Japan in the postwar years was inspired by the lectures of W. Edwards Deming (1900-1993), a statistic for the U.S government. Deming based his proposals on the experience of U.S firms operating under wartime- industrial standards.

Industrial manufacturing is a major growth sector for the Indian economy with diverse companies including those engaged in manufacturing of machinery and equipment, electrical and metal products, cement, building and construction material, rubber and plastic products and automation technology products. India is expected to become the fifth largest manufacturing country in the world by the end of year 2022. Government of India aims to

achieve 25 per cent GDP share and 100 million new jobs in the manufacturing (production) sector by 2022. Production is a process of combining various material inputs and immaterial inputs (plans, know-how) in order to make something for consumption (output). There has been a growing interest by Indian production and manufacturing organizations in the concepts and techniques being used by Japanese managers. In particular, quality circles have been found to be valuable in some companies and have thus been seen by many as being the answer to the declining productivity in companies in the United States. However, there is considerable concern by these authors that an indiscriminate acceptance of the quality circle concept may result in a series of problems for many organizations attempting its use.

This study attempts to provide an objective analysis of the quality circle concept as a method for improving productivity and quality. The concept of quality circles is sound with real successes evident. It is necessary for a company attempting to use quality circles to have a strong degree of commitment by management to respond to the involvement of their employees. And this study is focusing on the working and effectiveness of quality circle in Indian business scenario with Kerala polymer industry.

## 1.2 Significance of the study

The Indian polymer industry grew at an impressive rate from 2000 to 2011 to become the world's third largest consumer of polymers after China and the US. The current government is promoting and encouraging polymer industry very well. And there have been a question that how the problems are solved facing employees in every manufacturing firm, is it carried out by implementation of quality circles in firms? So the significant of the study become the role of quality circle in improving productivity. And this study is done by giving a special reference to Kerala polymer industry.

### 1.3 Objectives of the study

- To analyze the impact of quality circles
- To evaluate the effectiveness and role of quality circles in improving productivity

### 1.4 Hypotheses

The following hypotheses were formulated for testing in this study:

- **H1:** There is significant relation between quality circle and productivity
- **H0:** There is no significant relation between quality circle and productivity
- **H2:** There is a positive correlation between productivity and quality circle
- **H0:** There is no any positive correlation between productivity and quality circle
- **H3:** There is an association between gender and success of quality circle
- **H0:** There is no any association between gender and success of quality circle

### 1.5 Scope of the study

Quality circles are now widely used in manufacturing industries and Polymer industry is one amongst the largest manufacturing industry in India. This project is studying the role of quality circles in polymer industry. This study covers the area of role of quality circles in improving productivity, structure and success factors of QCs, and member's perception towards QCs in Kerala Polymer industry.

### 1.6 Research Design

Research design used in this study is both descriptive and analytical. Data analysis consisted of descriptive statistics such as mean, standard deviation and tests of hypotheses such as correlation, chi-square test, and t-test.

## II THEORETICAL FRAMEWORK

### 2.1 Quality Circle: Origin and development

Quality circle is a participative management concept that has been gaining more and more popularity. Although it is in Japan that this concept was concretized and demonstrated its rudimentary origin is traced to the United States where problem solving groups have existed since 1930s. The quality circles developed in Japan in the 1960s. Much of their development was due to the early work of the American experts Joseph Juran and Edward Deming both of whom made frequent trips to Japan in the 1950s. The quality circle in its form known today was conceived and introduced by Dr. Kaot Ishikawa, a Japanese chemical

engineer and quality control expert, when he was an advisor with JUSE (Union of Japanese Scientist and Engineers) in 1962. The quality circles concept took birth in India in 1980 when this concept was introduced in the Hyderabad unit of the Bharat Heavy Electricals Ltd. (BHEL). The growing popularity of the quality circles in India is evident from the increase in the numbers of organizations which introduce quality circles.

### 2.2 Meaning and nature

A quality circle is "a voluntary group of people who meet together on a regular basis identify, analyze and solve quality, productivity, cost reduction, safety and other problems in the work area, leading to improvement in their performance and enrichment of their work life" the generally regarded ideal size of a QC is around ten members.

### 2.3 Objectives/philosophy

The main objective/philosophy of the quality circles are to reduce errors and enhance quality and productivity, inspire more effective teamwork, promote job involvement and participation, increase employee motivation, create problem-solving capability, build an attitude of problem prevention, improve communication in the organization, develop harmonious manager-worker relationship, promote personal and leadership development, develop a greater safety awareness, promote cost reduction and catalyze attitudinal changes for greater cohesiveness and teamwork.

### 2.4 The process of QC

As indicated earlier, a quality circle is a group of people who meet at regular intervals, say once in a week or fortnight, to solve work-related problems. The process involves the following steps.

**Identification of problem:** the members may be able to identify several problems in their area. Quality, productivity, cost reduction, housekeeping and safety are but some of the general categories of problems which may be identified by QC. Techniques such as brainstorming may be used to help problem identification.

**Problem selection:** prerogative of the circle. When several problems are identified, a selection of problems for the further process of the QC may become necessary.

**Problem analysis:** the circle members analyze the selected problems. If needed, the circle may take the assistance of experts and consultants.

### **Recommendations to the Top management:**

Finally, the circle makes its recommendations to its departmental heads in the first instance, normally once in 7-8 weeks, and selected cases of all circles are presented to the top management, normally once in 2-3 months (known as management presentation). In a management presentation, the leader and members describe to their manager what project they have been working on and what recommendations they wish to make concerning it. It is the top management who decides whether the recommendations should be accepted and implemented.

### **2.5 Quality circle and productivity**

The concept of productivity has received international attention with the declaration of 1982 as the International Year of Productivity. Although the concept has its origin in the classic-economic thoughts, renewed attention is being given by corporate circles since 1982. Traditionally, productivity is considered simply as a measure of the input-output relationship. The concept of 'productivity' was originally developed by the classical economists like Adam Smith, David Ricardo and J. S. Mill. They propounded the idea of the 'Law of Diminishing Returns' for all resources

### **2.6 Factors affecting Productivity**

Since the study is primarily concerned with the functioning of the QCs in the industrial organizations it is pertinent, at this stage to discuss, in brief, the major factors that have something to do with productivity improvement in such organizations. Six major factors have been identified which affect productivity in an industrial organization and such factors have been discussed, in brief, below.

i) **Quality of raw materials:** Apart from ensuring the right type of quality of raw materials, better methods (including provision for efficient handling) are required to eliminate substantial wastage which is quite common in the industrial organizations.

ii) **The process employed** Drive for better methods of using the valuable resources (both human and non-human) demands that technologies should be effectively used with a view to improving the process (es). R&D programmes in that direction have to be undertaken on a continuing basis.

iii) **Employment of capital** facilities in India, the physical effort of a blue-collar employee is far less

than his counterparts in the industrially-advanced countries like the USA, the UK, Japan, etc.

iv) **Utilization of man-power:** Man-power is the basic resource. It is really necessary to see that both the general planning and the methods of work are not wasteful and can help avoid fatigue and frustration with a view to utilizing the existing man-power in an optimum manner.

### **2.7 QC and Productivity Improvement**

Improvement of productivity through SGA (including QC) has been experienced by many industrial organizations in recent times which have felt that effective utilization of man-power is vital for productivity improvement. The concept of 'total-factor productivity' has now become accepted in the corporate world to some extent and many organizations have started feeling that emphasis on labour productivity alone in a mechanical manner cannot certainly lead to productivity improvement.

In this context, it may be noted that a QC deals with intrinsic motivation of its members and helps them participate in the real sense in all the areas of functioning like design, maintenance, production, inspection, servicing, etc. Their involvement, no doubt, enhances the organizational productivity, apart from their individual productivity.

### **2.8 Industry profile**

The Indian sub-continent has established itself as the most exciting and dynamic emerging market in the world and is one full of potential and investment opportunities. India stands third in polymer consumption globally after China and US. With a population greater than China but with a polymer demand less than 20%, the region is expected to enjoy the fastest growth in polymer demand anywhere in the world over the next five years; According to a recently published study by Applied Market Information Ltd (AMI Consulting), there is now massive investment occurring in the region's petrochemical, polymer production and downstream plastic processing industries, driving strong growth in polymer demand. Plastic industry is significantly contributing to the growth of Indian economy

#### **2.8.1 Indian Plastics Market Overview**

The Indian plastics market is comprised of around 25,000 companies and employs 3 million people. The domestic capacity for polymer production was 5.72m tones in 2009. The State of Gujarat in Western India is the leading plastics processing hub and accounts for the largest number of plastics manufacturers, with over 5,000 plastics

firms. The growth rate of the Indian plastics industry is one of the highest in the world, with plastics consumption growing at 16% per annum (compared to 10% p.a. in China and around 2.5% p.a. in the UK). This provides excellent opportunities for polymer manufacturing firms.

### 2.8.2 The plastic industry in Kerala

The plastic industry in Kerala is in generally the area of flexible packaging, pipes with a few units in injection and blow molding. Being a high consumption state with a lot of skilled manpower, there is a huge potential waiting to be

tapped. There is also a huge NRI population waiting to invest in fresh ventures. It is clear that plastic industry will continue on its upward trend with boosting prospects for fresh investments in polymerization and downstream processing capacity. KSSIA intends to sow these seeds and help entrepreneurs and investors reap the benefits in future. Rising Kerala 2014 – Plastic expo was bring in to focus the emerging opportunities, innovations, technology, machineries and successful players in the field for interaction with the prospective and budding entrepreneurs and investors.

## III. DATA ANALYSIS AND INTERPRETATION

**Table 3.1 One-Sample T Test - QC & Productivity**

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
productivity	19.478	49	0.000	12.80000	11.4794	14.1206
Quality circle	68.255	49	0.000	29.46000	28.5926	30.3274

Source: primary data

From the above table showing one sample T-Test, value of the T-Test has a significant value of 0.000. This value is less than the value of 0.5. Researcher arrives at the conclusion that the mean

difference is statistically significant. So accept the alternative hypothesis. It means quality circle has significant impact on productivity.

**Table 3.2 Correlations - between Productivity and QC**

		quality circle	productivity
quality circle	Pearson Correlation	1	0.168
	Sig. (2-tailed)		0.244
	N	50	50
productivity	Pearson Correlation	0.168	1
	Sig. (2-tailed)	0.244	
	N	50	50

Source: primary data

Value of Pearson correlation is 1. There is correlation. Significant value is 0.244. There is a positive correlation between quality circle and

productivity. But the relationship is not that much strong as the value shows 0.244.

**Table 3.3**

### Chi-Square Tests – Gender & QC

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.399 <sup>a</sup>	12	0.830
Likelihood Ratio	8.725	12	0.726

Linear-by-Linear Association	0.140	1	0.708
N of Valid Cases	50		

Source: primary data

a. 26 cells (100.0%) have expected count less than 5. The minimum expected count is .48.

**Table 3.4**

**Symmetric Measures – Gender & QC**

		Value	Approx. Sig.
Nominal by Nominal	Phi	0.385	0.830
	Cramer's V	0.385	0.830
N of Valid Cases		50	

Source: primary data

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table number 3.4 gives results of the chi-square test of QC and gender. Chi square value is 7.399 with a significant value of 0.830. This is more than the value of 0.5. So accept the null hypothesis. The researcher concludes that there is no significant association between gender and quality circle.

**IV. FINDINGS**

Brain storming and cause & effect studies are more used to solve problems in QC. Training received by members is important to the success of QC running. Implementation out of accepted suggestion is very little. The rating of public speaking skill attained through QCs is 2, and there is an average overall rating of 3 to QCs in Kerala polymer industry. Managerial recognition to the circle is positive. From one sample T Test arrive at the conclusion of quality circle has significant impact on productivity. And the positive correlation conveys the idea that quality circle improves productivity. There is no association between gender and quality circle.

**V. CONCLUSION**

The study has began with an extensive literature survey on quality circles in polymer industry and this was followed by a discussion on [6].

the concept of quality circles, quality circle movement, this was followed by research methodology, results and discussion. The study titled “Quality Circle and Productivity; in Kerala Polymer Industry Aspects” , the researcher found that the quality circle has a role in improving productivity, but that is not much significant in the environment of Kerala polymer industry.

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